

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

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| In the Matter of |) | |
| |) | |
| LightSquared Subsidiary LLC |) | IB Docket No. 11-109 |
| Request for Modification of its Authority |) | |
| for an Ancillary Terrestrial Component |) | |
| |) | |
| In re the Application of |) | |
| |) | |
| LightSquared Subsidiary LLC |) | File No. SAT-MOD-20101118-00239 |
| Request for Modification of its Authority |) | |
| for an Ancillary Terrestrial Component |) | |

REPLY COMMENTS OF TRIMBLE NAVIGATION LIMITED

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SUMMARY

Trimble Navigation Limited (“Trimble”) continues to support the FCC’s goal to repurpose underutilized spectrum and make more wireless broadband services available to Americans. However, these objectives should not be achieved through actions that would impair the Global Positioning System (“GPS”), which has made government, private business, and the everyday activities of ordinary citizens more efficient, enjoyable, and safe.

The Technical Working Group’s test results and independent studies have all confirmed that LightSquared’s proposed network will cause significant interference to GPS. Out of the many thousands of comments submitted in this proceeding, none besides LightSquared has provided any technical analysis supporting LightSquared’s assertion that its alternative proposal to initiate operations using only its lower 10 MHz channel will alleviate the harmful interference its proposed terrestrial operations would cause to GPS. Moreover, the analyses to date have not included consideration of LightSquared’s handsets, which could create additional independent interference problems. Many parties also agree that LightSquared has attempted to downplay the harmful interference that will be caused to GPS by its operations by employing incorrect metrics, such as adopting an arbitrary and unacceptable interference threshold to measure performance degradation and unsubstantiated propagation modeling to determine the impact of its proposed operations on GPS.

While the vast majority of comments disagree with LightSquared’s arguments and express concern regarding the potential for its operations to harm GPS, the limited number of comments that support LightSquared fail to engage in any meaningful analysis of the substantive issues involved. Such comments instead focus generally on the need for more wireless broadband capacity, which is an issue that is not disputed in this proceeding.

LightSquared's continued assertions that the GPS industry knew about and in some instances supported LightSquared's current operations are without merit. The Commission's waiver of the integrated service rule and LightSquared's changed business plans drastically shifted the technical and regulatory environment in which GPS has been operating. Further, LightSquared's accusations that the GPS industry should have and could have built receivers to anticipate such changes are not supported in the record or in fact – there is no evidence in the record of any “superior” filters which LightSquared alleges that the GPS industry should have utilized years ago because there are none.

The Commission has an obligation to engage in sound spectrum planning and ensure that existing services are adequately protected by grouping like services together. GPS is not “squatting” on any spectrum as LightSquared and its supporters contend. Rather, the conflict arises from LightSquared's misguided proposal to build a free-standing, ubiquitous terrestrial network in adjacent spectrum long reserved for satellite purposes. Nor does the GPS industry propose that spectrum should be left fallow; rather, spectrum adjacent to GPS should be used for compatible operations, like other satellite services. To the extent that satellite spectrum is not utilized efficiently, the solution is to concentrate satellite uses in less spectrum (such as the spectrum adjacent to GPS), not attempt to force a costly, unnecessary, and unsuccessful transition on a spectrum use, GPS, that has proven its worth to millions of users and businesses. The FCC has an obligation to act in the public interest, and to ensure that new spectrum uses, such as LightSquared's, are not allowed to interfere with existing services, such as GPS. Given that LightSquared has been unable to show that its operations will not cause devastating interference to GPS, LightSquared must not be permitted to commence its proposed operations.

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REPLY COMMENTS OF TRIMBLE NAVIGATION LIMITED

Trimble Navigation Limited (“Trimble”), by its attorneys and pursuant to the *Public Notice* released on June 30, 2011 in the above-referenced proceeding,^{1/} hereby submits these reply comments to the Federal Communications Commission (“FCC” or “Commission”) addressing the thousands of comments filed in response to the final report of the Technical Working Group (“TWG”),^{2/} which analyzed the potential for interference to Global Positioning System (“GPS”) receivers caused by the proposed high-power, stand-alone terrestrial network of LightSquared Subsidiary LLC (“LightSquared”), and LightSquared’s “Recommendations” document released concurrently with and in response to the findings in the TWG Report.^{3/}

I. INTRODUCTION

In its comments, Trimble explained its support of the Administration’s and the

^{1/} *Comment Deadlines Established Regarding the LightSquared Technical Working Group Report*, Public Notice, IB Docket No. 11-109, DA 11-1133 (rel. June 30, 2011).

^{2/} *See* Technical Working Group Report, Final Report, IBFS File No. SAT-MOD-20101118-00239 (filed June 30, 2011) (“TWG Report”).

^{3/} *See* Recommendation of LightSquared Subsidiary LLC, IBFS File No. SAT-MOD-20101118-00239 (filed June 30, 2011) (“LightSquared Recommendations”).

Commission's goal to repurpose underutilized spectrum and increase the availability of wireless broadband services, but cautioned that GPS – as one of the most powerful existing communications capabilities used by all levels of government and the public and representing billions of dollars of government and private investment – should not be harmed in pursuit of this goal. It noted that, on an accelerated timeframe and through thousands of hours of testing and analysis involving the hard work of more than 100 experts, the TWG thoroughly examined the potential for harmful interference caused by LightSquared's proposed terrestrial operations to GPS and confirmed the validity of the concerns raised by the GPS industry and government users: (1) LightSquared's original deployment plans (using both the "upper" portion of the band directly adjacent to GPS spectrum and the "lower" portion of the band which is 23 MHz away from the GPS spectrum) would cause massive, incurable interference to every kind of GPS device, (2) there is no viable means to modify the hundreds of millions of existing GPS devices already in the hands of consumers, businesses, and government users in order to reduce their vulnerability to interfering transmissions, and (3) even LightSquared's late-offered proposal to operate initially just on its lower 10 MHz channel would not eliminate harmful interference to a large portion of the 500 million GPS receivers in use.

Without so much as acknowledging the herculean effort expended by hundreds of interested parties during the comprehensive evaluation of LightSquared's initial proposal or the fact that its initial proposal failed in all respects (despite LightSquared's repeated assurances to the Commission to the contrary), LightSquared released its own "Recommendations" document prepared wholly outside of the TWG process, which reinterpreted the test results in ways not corroborated by any other party involved in the testing and essentially blames the failure of its initial proposal on the GPS industry. However, as Trimble demonstrated in its initial comments,

the fact that LightSquared's proposal is unworkable cannot be resolved with more testing – the interference issue is a fundamental problem of physics in that radio signals billions of times more powerful cannot be transmitted in spectrum even 23 MHz away from spectrum where a huge embedded population of highly sensitive satellite receivers are in operation without causing devastating interference.

LightSquared wants to immediately deploy its proposed commercial network, but the costs of allowing it to do so are extraordinarily high. These costs include the costs of further wasted capital in proceeding with a terrestrial network that will cause extreme damage to critical public and private sector applications; the costs associated with the failure of these applications, such as the failure of E911 calls and the loss of life caused by aviation, maritime, or other accidents caused by failed GPS systems; the costs to industry and the government in attempting to minimize these devastating consequences; and the costs of the foregone efficiency benefits due to degraded GPS. While the FCC has given LightSquared the benefit of every doubt in allowing LightSquared to show that its proposal will work, at some point the FCC must make the decision that needs to be made in this instance, which is to prohibit LightSquared from commencing its commercial operations in the L-Band, in order to protect the government, industrial, and individual users of GPS now and in the future.

II. THERE IS WIDE AGREEMENT ON THE OUTCOME AND MEANING OF THE TEST RESULTS REGARDING LIGHTSQUARED'S PROPOSED NETWORK

A. The Record Highlights the Interference that LightSquared Will Cause to a Broad Array of Devices

The record in this proceeding inescapably demonstrates that LightSquared's proposed network configuration would result in extensive interference to all types of GPS receivers and

GPS-related applications in all deployment scenarios.^{4/} Commenting parties broadly agree that the TWG test results conclusively show that LightSquared's proposed terrestrial mobile broadband operations would cause harmful interference for all GPS receiver types and that there are no mitigation techniques available that would resolve this problem.^{5/} Tellingly, no party has presented credible and objective technical evidence corroborating LightSquared's self-serving claims that interference can be eliminated. Given the intense interest in freeing additional spectrum for wireless broadband, as evidenced by the supportive comments submitted by other parties in this proceeding, the fact that LightSquared stands alone on the technical issues speaks volumes.

Many of our nation's leading technology and industrial companies, however, are lined up on the other side of the interference issue. For instance, Lockheed Martin Corp. ("Lockheed Martin") states that the TWG Report confirmed that LightSquared cannot operate its network without causing harmful interference to receivers and devices operating with GPS and other radionavigation-satellite service systems, including Lockheed Martin's Regional Positioning System.^{6/} Deere & Company ("Deere") similarly finds that the TWG test results demonstrate

^{4/} See, e.g., Comments of Garmin International, Inc., IB Docket No. 11-109, at 23 (filed Aug. 1, 2011) ("Garmin Comments") (arguing that LightSquared's system "will result in a widespread degradation of GPS receiver performance and severely limit, if not eviscerate, GPS utility as it currently exists"); Comments of Lockheed Martin Corporation, IB Docket No. 11-109, at 3 (filed July 29, 2011) ("Lockheed Comments") (stating that "the TWG Report concludes that LightSquared's proposed terrestrial mobile broadband operations will cause harmful interference to GPS receivers and applications"); see also Comments of Deere & Company, IB Docket No. 11-109, at iii, 11 (filed Aug. 1, 2011) ("Deere Comments").

^{5/} See Lockheed Comments at 3; Comments of AT&T, Inc., IB Docket No. 11-109, at 7 (filed Aug. 1, 2011) (agreeing that additional testing is needed of the lower 10 MHz proposal before LightSquared is permitted to proceed).

^{6/} See Lockheed Comments at iii.

that LightSquared's service would cause widespread harmful interference to all classes of GPS receivers, particularly high precision receivers.^{7/}

Moreover, additional technical analyses submitted by commenting parties in this proceeding support the TWG's independent conclusions; on the other hand, there were no technical analyses submitted supporting LightSquared's reading of the test data. For example, comments submitted by Stansell Consulting ("Stansell") show that the reductions in GPS receiver bandwidth and degradation in Carrier-to-Noise ratio that would result from LightSquared's operations would be devastating to GPS operations, particularly for high precision applications.^{8/} Stansell explains that GPS applications need "wide, interference-free bandwidth" in order to be effective.^{9/} Stansell also agrees that evidence exists that LightSquared's lower 10 MHz proposal will cause harmful interference to some GPS applications.^{10/}

Charles W. Rhodes, former Chief Scientist of the Advanced Television Test Center Inc., also concluded using his own analysis that LightSquared's proposed terrestrial transmissions would cause harmful interference to GPS receivers.^{11/} Pursuant to his simulations, Mr. Rhodes found that the average noise floor increase in the GPS band resulting from LightSquared's

^{7/} See Deere Comments at 11, 13-14.

^{8/} See Comments of Stansell Consulting, IB Docket No. 11-109, at 2-3 (filed Aug. 1, 2011); Erratum, IB Docket No. 11-109, at 2-3 (filed Aug. 8, 2011) ("Stansell Comments").

^{9/} See *id.* at 4.

^{10/} See *id.* at 5-6.

^{11/} See Comments of Charles W. Rhodes, IB Docket No. 11-109, at 1 (filed Aug. 3, 2011). As explained in his comments, Mr. Rhodes was responsible for the technical aspects of the testing of Advanced Television Systems and digital television signals.

network would be approximately 13 dB.^{12/} In addition, Mr. Rhodes observed that the difference in power levels between LightSquared's signal and GPS signals would likely result in the desensitization of GPS transistors.^{13/} The results of these two effects, according to Mr. Rhodes, would be significant jamming of GPS reception.

Comments submitted by parties regarding the potential interference from LightSquared's operations to GPS receivers in cellular devices are particularly troubling. Verizon Wireless ("Verizon") explains that cellular GPS devices, which are installed in millions of mobile devices in the U.S., are used to provide a critical public safety objective – E911 location accuracy.^{14/} Without properly functioning GPS receivers in such devices, public safety entities would be unable to obtain accurate location data information of 911 callers in emergencies.^{15/} Verizon argues that "any degradation in E911 location accuracy caused by interference to GPS – even degradation that does not rise to the level of non-compliance with E911 requirements – would impact the first responders who provide essential public safety services to wireless users calling 911."^{16/}

B. The Results Are No Different Based on LightSquared's Lower 10 MHz Proposal

LightSquared continues to claim that its proposed operations in the lower 10 MHz of the Mobile Satellite Service ("MSS") band will solve the interference problem for 99 percent of GPS

^{12/} See *id.* at 3. While LightSquared continues to incorrectly assert that an increase in the noise floor of 6 dB would be acceptable, this analysis shows that LightSquared's operations would not even comply with this elevated level in the noise floor.

^{13/} See *id.* (adding that any increase in power would likely end the usefulness of most GPS receivers).

^{14/} See Comments of Verizon Wireless, IB Docket No. 11-109, at 2 (filed Aug. 1, 2011) ("Verizon Comments").

^{15/} See *id.*

^{16/} *Id.* at 10.

receivers.^{17/} LightSquared asserts that there will be ample separation between its frequencies and GPS frequencies, resulting in signal overload for only a limited number of precision GPS devices located “in non-urban settings, where receivers have been specifically designed to receive signals from the L-band frequencies in which LightSquared is authorized.”^{18/} LightSquared further argues that interference to such GPS receivers would only occur because they are unable to adequately reject LightSquared’s transmissions on its frequencies, which is largely a problem of their own making.^{19/} Comments jointly submitted by several public interest groups assert that the TWG test results regarding LightSquared’s lower 10 MHz proposal were “inconclusive.”^{20/} The Public Interest Comments have it wrong. The consensus is that testing has not alleviated the significant concerns that LightSquared’s lower 10 MHz proposal will cause harmful interference to GPS.

Instead, commenting parties agree with Trimble that LightSquared’s claim that a lower 10 MHz signal protects in excess of 99 percent of GPS receivers is patently false and disingenuous.^{21/} Deere, for example, reported that “[a]ll high precision receivers under test experienced harmful interference from a Low 10 MHz signal.”^{22/} Garmin International Inc. (“Garmin”) added that LightSquared’s assertion that “[t]he results from static *and dynamic tests* show that none of the devices experienced harmful interference from LightSquared’s lower 10

^{17/} See Comments of LightSquared Subsidiary LLC, IB Docket No. 11-109, at 9-10 (filed Aug. 1, 2011) (“LightSquared Comments”).

^{18/} *Id.* at 10.

^{19/} *See id.*

^{20/} See Comments of New America Foundation, Free Press, Public Knowledge and Media Access Project, IB Docket No. 11-109, at 6 (filed Aug. 1, 2011) (“Public Interest Comments”).

^{21/} *See* Deere Comments, at 16.

^{22/} *Id.* at 16, 28-30.

MHz channel”^{23/} was surprising “since absolutely no dynamic tests at all were performed on General Location/Navigation devices based on use of that lower channel.”^{24/}

In fact, no third party has provided any technical analyses that support LightSquared’s evaluation of the test data for the lower 10 MHz configuration. The majority of the commenting parties agree that none of the TWG sub-teams could conclusively determine that LightSquared’s lower 10 MHz proposal would mitigate harmful interference to GPS receivers.^{25/} For instance, Garmin reported that the Aviation sub-team’s test results and analysis showed a negative margin – or loss of operation – for aviation GPS receivers from LightSquared’s operations in the lower 10 MHz channel.^{26/} Garmin added that, contrary to LightSquared’s claims, the General Location/Navigation sub-team found that nearly 70 percent, or 20 out of 29 devices, would experience harmful interference from LightSquared’s operations in the lower 10 MHz channel.^{27/} As observed by the Aircraft Owners and Pilots Association (“AOPA”) and the General Aviation Manufacturers Association (“GAMA”), RTCA, Inc. also concluded that LightSquared’s proposed use of the upper 10 MHz of its spectrum would be “entirely incompatible with continued aviation use of GPS” and that LightSquared’s use of only the lower 10 MHz channel

^{23/} LightSquared Recommendations, at 29.

^{24/} Garmin Comments, at 40.

^{25/} See Lockheed Comments, at 8-9 (stating that with respect to operations in the lower 10 MHz, “the TWG results showed that there would be harmful interference into a significant number of GPS receivers across many device types and deployment scenarios”); Deere Comments, at 16, 28-30 (noting that LightSquared’s lower 10 MHz configuration would potentially disrupt millions of GPS devices); Comments of the U.S. GPS Industry Council, IB Docket No. 11-109, at 58 (filed Aug. 1, 2011) (“USGPSIC Comments”); Comments of the National Public Safety Telecommunications Council, IB Docket No. 11-109, at 5-6 (filed July 29, 2011) (“NPSTC Comments”) (stating that NPSTC has “little confidence that those tests provide assurance there will be no interference to public safety under LightSquared’s modified deployment proposal”).

^{26/} See Garmin Comments, at 33; Lockheed Comments, at 12-13; Comments of Rockwell Collins, Inc., IB Docket No. 11-109, at 11 (filed Aug. 1, 2011) (“Rockwell Comments”); Comments of the Aircraft Owners and Pilots Association and the General Aviation Manufacturers Association, IB Docket No. 11-109, at 17, 20 (filed Aug. 1, 2011) (“AOPA/GAMA Comments”).

^{27/} See Garmin Comments, at 40; see also USGPSIC Comments, at 6; Deere Comments, at 17.

would require further testing.^{28/} Garmin similarly noted that the Federal Aviation Administration's report stated that high precision GPS devices used in the aviation industry would unquestionably be affected by LightSquared's lower 10 MHz proposal.^{29/}

In line with almost all commenting parties, Verizon observes that the TWG test results conclusively demonstrate that LightSquared's proposed operations in the upper 10 MHz of its authorized spectrum would interfere with cellular GPS receivers.^{30/} Further, Verizon asserts that testing performed to date on LightSquared's lower 10 MHz proposal does not provide the requisite level of certainty that cellular GPS devices, such as those providing critical E911 location data, would not experience harmful interference from LightSquared's network.^{31/} In light of these findings and the essential role that GPS receivers play providing location-based E911 services, it is critical that they be protected from any and all interference.

C. Comments Show Interference from LightSquared Handsets as Well

While much of the analysis to date of the interference that LightSquared will cause to GPS has focused on LightSquared's base station transmitters, several commenting parties note that there will be potential interference from LightSquared's handsets. In fact, those handsets may cause just as much interference to GPS receivers as LightSquared's base stations. Unfortunately, LightSquared had no dual purpose satellite/terrestrial handsets available for testing because they do not yet exist, which is particularly troubling because LightSquared originally expected to launch service this year.^{32/} This void in the record is entirely of

^{28/} AOPA/GAMA Comments, at 5; *see also* Garmin Comments, at 24; USGPSIC Comments, at 29.

^{29/} *See* Garmin Comments, at 29; Rockwell Comments, at 7-8.

^{30/} *See* Verizon Comments, at 4.

^{31/} *See id.* at 10.

^{32/} *See, e.g., SkyTerra Communications, Inc., Transferor, and Harbinger Capital Partners Funds, Transferee, Applications for Consent to Transfer of Control of SkyTerra Subsidiary, LLC*, Memorandum

LightSquared's own making, further raising basic questions about LightSquared's technical bona fides.

This void, however, does not mean that there are not serious concerns over handset interference. Deere states that the TWG's test results of simulated handsets suggest that LightSquared's handsets present "a meaningful independent interference threat" to GPS signals.^{33/} General location/navigation devices during simulated testing were found to have suffered harmful interference from those handsets at a range of nearly 10 meters, with all devices experiencing harmful interference at a range of 15 centimeters or less.^{34/} The High Precision sub-team estimated that high precision devices could potentially be affected by LightSquared's handsets at a distance of 1400 meters.^{35/} Deere asserts that because LightSquared's handsets would routinely come in close contact with general location/navigation devices and high precision receivers, the interference described above presents a "serious problem," which LightSquared has yet to acknowledge.^{36/} Stansell agrees, cautioning that LightSquared's handsets are likely to harm GPS reception *even more* than its base stations.^{37/} It reports that "[p]ublished estimates of LightSquared out-of-band-emission (OOBE) into the GPS L1 band indicate that at a distance of 2 meters one handset will hurt GPS reception (reduce [Carrier-to-Noise ratio]) by 9.5 dB, which is devastating."^{38/} Both parties agree that the impact of

Opinion and Order and Declaratory Ruling, 25 FCC Rcd 3059, ¶ 56 (2010) (reporting that LightSquared's predecessor anticipated commencing commercial operations before the third quarter of 2011).

^{33/} Deere Comments, at 31.

^{34/} *See id.* at 32.

^{35/} *See id.*

^{36/} *See id.*

^{37/} *See* Stansell Comments, at 5.

^{38/} *Id.*

LightSquared's handsets on GPS must be thoroughly investigated before LightSquared is allowed to proceed with its proposal.^{39/}

The Commission recently confirmed that it is committed to protecting GPS from harmful interference and will make its decision on the LightSquared proceeding based on technical data.^{40/} At a press conference held by the Commission on August 9, 2011, Chairman Genachowski stated that his focus "is on making sure that the process is fact-based, engineering-based."^{41/} The technical data and analyses in this proceeding clearly demonstrate that LightSquared's operations have the potential to cause widespread, unpredictable interference to GPS, even under the lower 10 MHz proposal. The FCC must therefore conclude that the condition that LightSquared's proposed network will not interfere with GPS has not been met, and therefore LightSquared may not proceed with its proposed terrestrial operations. Given the extremely high costs to GPS users, the economy, and safety of life and property associated with interference to GPS, the FCC cannot authorize LightSquared to begin operating until it is certain that LightSquared's proposed operations will not interfere with GPS.

III. LIGHTSQUARED CONTINUES TO ATTEMPT TO MINIMIZE INTERFERENCE BY EMPLOYING INCORRECT METRICS

LightSquared has attempted to diminish the meaning of the TWG test results and understate the interference that would result from its proposed network by employing improper metrics. First, rather than using the correct interference threshold of a 1 dB degradation in

^{39/} See Deere Comments, at 32; Stansell Comments, at 5.

^{40/} As explained in its Comments, Trimble notes that the Commission explicitly undertook a duty in 2005 to proactively protect GPS from harmful interference.

^{41/} Adam Bender, *FCC Aims for "Purely Technical" Decision on LightSquared*, COMM. DAILY, at 2 (Aug. 10, 2011).

Carrier-to-Noise ratio, LightSquared suggests using a threshold of 6 dB.^{42/} LightSquared claims that this threshold is more “realistic” because it relates to “a perceptible change in device performance from an end-user’s perspective.”^{43/}

Commenting parties, however, demonstrate that LightSquared’s technical assertions are wrong, with such parties supporting the commonly adopted 1 dB threshold. Garmin, for example, states that “[t]he use of 1 dB reduction in effective [Carrier-to-Noise] as a quantification of harmful interference to GPS has a well recognized basis” and is an internationally accepted standard.^{44/} Garmin notes that LightSquared’s use of the 6 dB threshold is “novel” and was only used to help support LightSquared’s claims that “100 percent” of general location/navigation GPS devices would suffer “no meaningful” interference.^{45/}

Deere similarly asserts that a degradation of 1 db is the appropriate metric for measuring interference because a 6 dB degradation in Carrier-to-Noise ratio would make GPS satellite acquisition impossible in many instances.^{46/} Deere clarifies that “[i]n other FCC rule parts involving space-to-earth communications the FCC defines interference as 1 dB or more of

^{42/} See LightSquared Comments, at 7. LightSquared appears to question the use of the 1 dB threshold only for evaluating general location/navigation devices and not, for example, precision and network devices. Indeed, in its Recommendations document, it characterized a 1 dB increase in the Carrier-to-Noise ratio as “unfortunate” with respect to precision and network devices, even using just the lower 10 MHz band, apparently recognizing that a 1 dB increase in the Carrier-to-Noise ratio was unacceptable for those devices. See LightSquared Recommendations, at 15. LightSquared does not explain why users of precision and network devices would perceive interference at the 1 dB level but it would require an increase of 6 dB in the Carrier-to-Noise level for users of general location/navigation devices to have the same perception. In any case, LightSquared’s assertion that it is “only logical” that the applicable threshold should relate to a perceptible change in device performance from an end-user’s perspective is wholly unsupported.

^{43/} LightSquared Comments, at 7.

^{44/} Garmin Comments, at 42.

^{45/} See *id.* at iv (reporting that nearly 70 percent of general location/navigation GPS devices would suffer harmful interference under the accepted industry standard of harmful interference, even with operations confined to the lower 10 MHz channel).

^{46/} See Deere Comments, at 19.

degradation, and given the highly sensitive nature of GPS receivers, the same metric should be applied in the instant situation.”^{47/} Stansell adds that allowing LightSquared to reduce bandwidth and degrade the Carrier-to-Noise ratio by up to 6 dB “would be devastating to high precision devices used for agriculture.”^{48/}

Second, LightSquared asserts that the FCC should accept the interference results in its Recommendations Document (and not the TWG Report) because it and the TWG used different propagation models.^{49/} However, the data developed during the live-sky testing in Las Vegas does not conform to LightSquared’s preferred propagation models.^{50/} Moreover, as the General Location/Navigation sub-team of the TWG pointed out, among other deficiencies, the WI-LOS and Korowajczuk models obscure the effects of unobstructed or complementary propagation paths^{51/} and are generally used in communications link budget analyses, but not in interference analyses.^{52/} LightSquared’s comments fail to address these significant demonstrated deficiencies to the WI-LOS and Korowajczuk models, choosing incorrectly and without support to assert that “[t]he use of a free space model improperly skews the results.”^{53/} Like all of LightSquared’s technical assertions, its self-interested view is supported by no one else, or any credible technical evidence in the record. Until LightSquared can prove that the WI-LOS and Korowajczuk models

^{47/} *Id.* at 19.

^{48/} Stansell Comments, at 3.

^{49/} LightSquared Comments, at 8.

^{50/} TWG Report, at 124. As the General Navigation/Location sub-team report pointed out, the live-sky testing “allowed the sub-team to verify that a free-space propagation model accurately represents the path loss that is realizable in the real world ... [and] the inadequacy of both the [WI-LOS and Korowajczuk] models as neither of them came close to adequately capturing the path losses that were observed in Las Vegas.” *Id.* at 136.

^{51/} *Id.* at 124.

^{52/} *Id.* at 137.

^{53/} LightSquared Comments, at 8.

it supports conform to the actual performance of its base stations or that the TWG Report's analyses of those models are inaccurate, the Commission must recognize the results of the more generally accepted free-space approach.

IV. MOST OF THOSE SUPPORTING LIGHTSQUARED DO NOT FOCUS ON THE INTERFERENCE ISSUES

Most of the comments filed that support LightSquared do not focus on the significant interference problems at issue in this proceeding; rather, those comments are based entirely on the benefits associated with increased access to wireless broadband capacity.^{54/} For example, Leap Wireless International, Inc. and Cricket Communications, Inc. (collectively, "Leap") submitted comments explaining in detail that they see great benefit in LightSquared's promise to provide wholesale wireless broadband services.^{55/} These comments include a blanket statement, without referencing any of the TWG test results or any other concrete data or evidence, that "Leap agrees with LightSquared that the interference issues should be manageable if LightSquared deploys according to its modified plan."^{56/} Leap provides no basis for how it arrived at the conclusion that the significant interference issues addressed in detail by the thousands of commenters during these proceedings are "manageable." Open Range Communications Inc. similarly bases its comments on how it would like to use LightSquared's network to provide wireless broadband services.^{57/} Sprint Nextel Corporation ("Sprint") also

^{54/} See, e.g., Comments of The Computer & Communications Industry Association, IB Docket No. 11-109, at 3-7 (filed July 29, 2011) ("CCIA Comments") (arguing that LightSquared's proposed operations will increase competition in the wireless broadband market and promote the availability of broadband to consumers); Public Interest Comments, at 11-14; see also LightSquared Comments, at 11-12.

^{55/} Comments of Leap Wireless International, Inc. and Cricket Communications, Inc., IB Docket No. 11-109, at 2-4 (filed Aug. 1, 2011).

^{56/} *Id.* at 2.

^{57/} See Comments of Open Range Communications, IB Docket No. 11-109, at 1-6 (filed Aug. 1, 2011) ("Open Range Comments").

devotes many pages of its comments to discussing the deal it has reached with LightSquared regarding the provision of wireless broadband services.^{58/} These comments submitted by LightSquared's business partners, and which include no substantive analysis of the interference concerns at issue in this proceeding, or any independent, credible expert opinion or evidence, cannot outweigh the technical findings by the TWG and other interested parties that LightSquared's proposed operations will harmfully interfere with GPS.

In addition, while Trimble agrees that increasing access to wireless broadband service is a laudable goal, it cannot be pursued at the expense of a service that is critical to the U.S. economy and public. Trimble fully supports the Commission's efforts to make additional spectrum available for wireless broadband services; the Commission must not harm GPS in the process. Some commenters note the reference in the National Broadband Plan to making ancillary terrestrial component ("ATC") spectrum more useful for terrestrial operations.^{59/} In particular, the National Broadband Plan states that the "MSS allocation consists of a significant amount of bandwidth with propagation characteristics suitable for mobile broadband."^{60/} Such statements, however, were aspirational and did not predetermine any particular outcomes. The National Broadband Plan instead generally mentioned potentially increasing the terrestrial use of all MSS spectrum, without distinguishing among MSS spectrum bands.^{61/}

In fact, the National Broadband Plan itself demonstrates that LightSquared *did not* have the authority it claimed as of March 2010 when the National Broadband Plan was released.

^{58/} See Comments of Sprint Nextel Corporation, ID Docket No. 11-109, at 1-6 (filed Aug. 1, 2011) ("Sprint Comments").

^{59/} CCIA Comments, at 8; Open Range Comments, at 4.

^{60/} *Connecting America: The National Broadband Plan*, at 87, available at <http://www.broadband.gov/download-plan/> ("National Broadband Plan").

^{61/} See National Broadband Plan, at 87-88.

Instead, the National Broadband Plan noted the limitations in the ATC rules by stating that they “allow MSS providers to deploy terrestrial networks to enhance coverages in areas where the satellite signal is attenuated or unavailable.”^{62/} It further noted that the then-current rules required MSS licensees to “integrate MSS and ATC services, including notably, a requirement that all ATC handsets must have a satellite communications capacity.”^{63/} Had LightSquared already been given the authority to use such spectrum for high-powered terrestrial operations, the Commission would not have had to speculate, at least not in reference to the L-Band, regarding the potential use of the spectrum for mobile broadband use. As a follow-up to one of the specific recommendations in the National Broadband Plan, the FCC initiated a rulemaking proceeding intended to assess increasing the terrestrial use of the 2 GHz MSS band.^{64/} Another specific recommendation was for the FCC to “work closely with L-Band licensees and foreign governments to accelerate efforts to rationalize ATC-authorized L-Band spectrum to make it usable for broadband ATC service.”^{65/} Unlike its approach for the 2 GHz MSS band, the FCC failed to take that National Broadband Plan recommendation. Instead, it impermissibly changed the rules by waiver, allowing LightSquared to operate a terrestrial-only network.^{66/}

^{62/} *Id.* at 87.

^{63/} *Id.*

^{64/} See *Spectrum Task Force Invites Technical Input on Approaches to Maximize Broadband Use of Fixed/Mobile Spectrum Allocations in the 2 GHz Range*, Public Notice, ET Docket No. 10-142, WT Docket Nos. 04-356, 07-195, DA 11-929 (rel. May 20, 2011). The Commission’s May Public Notice specifically discusses whether it can authorize the use of the 2 GHz MSS spectrum for terrestrial operations *in addition* to the ATC already permitted in that band. *Id.* at 2-3. There, at least, the FCC correctly realized that ATC is not the equivalent of a stand-alone terrestrial network, which the FCC has failed to do with respect to the L-Band.

^{65/} See National Broadband Plan, at 88.

^{66/} See Application for Review, The U.S. GPS Industry Council, IBFS File No. SAT-MOD-20101118-00239, at 6-11 (filed Feb. 25, 2011). LightSquared itself appears to recognize the difference between the ability of the 2 GHz MSS band and the L-Band MSS spectrum to support terrestrial operations. LightSquared attempted to acquire spectrum in these other portions of the MSS band but was unwilling to pay the higher price this spectrum commanded due to the more manageable interference

V. GPS USERS AND MANUFACTURERS DID NOT SANCTION THE NEW POLICIES THAT THE COMMISSION HAS ADOPTED BY WAIVER

LightSquared again asserts that the “GPS industry participated in the development of the technical rules under which LightSquared will operate; negotiated the out-of-band emission limits that are reflected in the rules; and urged that the Commission grant LightSquared’s ATC application.”^{67/} Trimble does not disagree with these assertions. As discussed in detail in comments submitted by Trimble and others, however, the support and cooperation the GPS industry provided to LightSquared was premised on the FCC’s explicit commitment to protect GPS from interference and its promise to vigorously enforce, not waive, the integrated service requirement.^{68/} There is no way that the GPS industry could have predicted that the FCC in January 2011 would waive the integrated service rule (which also served to protect adjacent band operations), thus fundamentally changing the constraints under which LightSquared had always been required to operate.

Other commenters agree that the Commission’s January 2011 order deviated from all prior Commission decisions regarding ATC and therefore could not have been predicted. For example, Deere stated:

environment. *See, e.g.,* Phil Goldstein, *Analysis: LightSquared’s Options Include Deal with Sprint, Bid for TerreStar*, FIERCEWIRELESS.COM (June 16, 2011), *available at* <http://www.fiercewireless.com/story/analysis-lightsquareds-options-include-deal-sprint-bid-terrestar/2011-06-16> (speculating that Harbinger Capital Partners, the hedge fund backing LightSquared, may “bid on different spectrum that would not cause GPS interference, specifically the 20 MHz chunk of MSS spectrum TerreStar owns in the 2 GHz band”); *What’s Happening With TerreStar?*, TMF ASSOCIATES (June 14, 2011), *available at* <http://tmfassociates.com/blog/category/operators/ico/> (“It has been confirmed to us that Harbinger was one of the parties attempting to acquire TerreStar’s spectrum assets [in the TerreStar bankruptcy proceeding] . . .”); TerreStar Corporation, SEC Form 8-K (filed Jan. 26, 2010) (reporting a 90-day exclusive negotiation period to lease TerreStar’s satellite spectrum to Harbinger for \$30 million). In the unlikely event that LightSquared was not aware of the limitations on the use of the L-Band for MSS, it certainly should have figured it out by the time it considered bidding on the 2 GHz MSS spectrum.

^{67/} LightSquared Comments, at 4.

^{68/} *See* Comments of Trimble Navigation Limited, IB Docket No. 11-109, at 5-25 (filed Aug. 1, 2011) (“Trimble Comments”); USGPSIC Comments, at 29-39; Deere Comments, at 18-22.

Even a generous reading of the Commission's orders, rules and contemporaneous Commissioner statements regarding MSS ATC authorizations reveals exactly the *opposite* plan – the Commission was careful to adopt a scheme specifically designed to *prevent* ATC from becoming a ubiquitous terrestrial CMRS network overtaking the primary satellite purpose.^{69/}

Verizon similarly stated that “ancillary terrestrial operations are required by law (and have always been required) to protect GPS receivers and all other primary services from interference.”^{70/} Garmin also pointed out that “[t]he Bureau’s January 26, 2011 decision granting LightSquared a waiver to offer a widespread terrestrial broadband service represented a fundamental change in FCC policy.”^{71/}

Contrary to recent press reports, LightSquared’s business plans have changed considerably over time. Chief of the FCC’s Office of Strategic Planning Paul De Sa stated earlier this month, “I don’t think the [LightSquared predecessor company] SkyTerra plan was materially different from LightSquared’s business plan with respect to terrestrial and satellite architecture.”^{72/} Whether Mr. De Sa’s assessment of SkyTerra’s plans is accurate (and Trimble believes it is not) is besides the point. Even if those were SkyTerra’s plans, they were inconsistent with the FCC’s rules and policies prior to the January 2011 decision. The fact that LightSquared’s predecessors may have wished (or even wrongly believed) they had the right to build a free-standing terrestrial network did not make it so. LightSquared also believed that it could operate such a network without interfering with GPS, which proved astonishingly and

^{69/} Deere Comments, at 8 (emphasis in original).

^{70/} Verizon Comments, at 15.

^{71/} Garmin Comments, at 18.

^{72/} Lynn Stanton, *FCC Chairman, Staff Pledge to Protect GPS Operations*, TR DAILY (Aug. 9, 2011).

completely wrong.^{73/} In any case, however, there is nothing in the record to support this contention that LightSquared's business plan has remained the same. Indeed, the fact that the FCC believed it was necessary to waive the integrated service rule earlier this year in order to account for LightSquared's changed proposal is compelling evidence to the contrary.

LightSquared also again asserts that the GPS industry should have anticipated LightSquared's plans and the FCC's reaction to them, and should have built receivers to account for such circumstances, complaining that the "problem results from legacy GPS receivers being designed, in some cases deliberately, and, in the best case, inadvertently, based on an assumption that there would never be adjacent-band terrestrial transmissions."^{74/} Some of LightSquared's supporters similarly blame the interference issues on the "faulty" receivers used by the GPS industry.^{75/} These allegations continue to be baseless. First, GPS receivers are state-of-the-art and employ advanced filters that are designed and manufactured to screen out extremely powerful non-GPS signals.^{76/} Second, the receivers were designed with adjacent band operations in mind – just not the new adjacent band environment LightSquared now proposes, which would introduce to GPS devices signals billions of times stronger than the GPS signal.

The GPS industry's receivers also specifically took into account agreements with the MSS industry. LightSquared again claims that "[i]n some cases, GPS manufacturers even intentionally designed their receivers to receive signals from across the MSS L-band."^{77/} As

^{73/} Letter from Jeff Carlisle, Executive Vice President, Regulatory Affairs & Public Policy, LightSquared, to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-MOD-20101118-00239 (Dec. 20, 2010) ("[W]hile GPS interference is highly unlikely, even the possibility of such interference has nothing to do with LightSquared's integrated service showing.").

^{74/} LightSquared Comments, at 11.

^{75/} See Public Interest Comments, at 6, 8-9; Sprint Comments, at 6.

^{76/} See, e.g. USGPSIC Comments, at 56; Lockheed Comments, at 12; Deere Comments, at 25; Garmin Comments, at 32.

^{77/} LightSquared Comments, at 11.

discussed in detail in several comments (including Trimble's), extending GPS receivers was an action undertaken at the direction of providers of GPS augmentation services, like LightSquared. It is remarkably disingenuous, even for LightSquared, to provide GPS augmentation services to (and collect payments from) GPS providers, and, on the other hand, accuse the GPS industry of designing "inadequate" receivers that incorporate such capabilities.^{78/}

With respect to the test results, the fact, according to LightSquared, that some GPS receivers (*i.e.*, those in cellular, general location/navigation devices) will experience no interference if LightSquared uses only the lower 10 MHz of its spectrum is unrelated to the design of the receivers. The few receivers that may not experience harmful interference are narrowband receivers. As Trimble and others discussed in their comments, however, the industry trend continues to move from the use of narrowband receivers to the use of more precise wideband receivers, and therefore the fact that some narrowband receivers may not be as affected by LightSquared's operations will become increasingly irrelevant and the interference concerns with respect to GPS devices will become more pronounced.^{79/}

LightSquared further admonishes the GPS industry, stating that "[h]ad GPS device manufacturers employed filters, whose cost could have been as low as \$0.05 per device, beginning at the time that terrestrial operations were permitted in the L-band, the entire problem could have been avoided."^{80/} This assertion that manufacturers could have employed 5 cent filters to solve the problem is nonsensical. There is no support for this assertion in the record. First, as the TWG Report states throughout and commenting parties agree, no filters – at any cost

^{78/} See Trimble Comments, at 32, 56; USGPSIC Comments, at 43; Deere Comments, at 8.

^{79/} See Stansell Comments, at 3 (discussing GPS receivers' need for wider bandwidth to improve accuracy); Deere Comments, at 29; USGPSIC Comments, at 57 n.135.

^{80/} LightSquared Comments, at 11.

– exist that would do what LightSquared imagines.^{81/} Second, even if they did, retrofitting existing devices is not possible.^{82/} Third, this \$0.05 figure has been created out of thin air. Fourth, GPS device manufacturers designed their devices to operate under the technical and regulatory constraints that have traditionally governed the service, which necessarily included operating under the protection of the integrated service rule.^{83/}

VI. IT IS NOT IRRESPONSIBLE SPECTRUM MANAGEMENT TO PROTECT GPS

LightSquared asserts that protecting GPS from harmful interference “is premised on an unprecedented ‘squatters’ rights’ view of spectrum management,” “would make 40 MHz of L-band spectrum . . . unusable terrestrially,” and “would establish a bad precedent for other bands (*e.g.*, AWS bands) that potentially are available for broadband purposes . . .”^{84/} Several public interest organizations similarly argue that “[h]aving squatted on the L Band, the GPS industry effectively proposes that the Band lie fallow and become a sort of super guard band for the benefit solely of the GPS industry,” and that protecting GPS will set a “dangerous precedent.”^{85/}

^{81/} See, *e.g.*, Deere Comments, at iv-v; AOPA/GAMA Comments, at iv, 23-24.

^{82/} See, *e.g.*, Verizon Comments, at 8; Rockwell Comments, at 10-11; AOPA/GAMA Comments, at 24-25, 27; Garmin Comments, at 54.

^{83/} In addition to its now-tired complaints about GPS receivers, LightSquared recently accused the GPS industry of ignoring Department of Defense (“DoD”) mandates for receiver standards. See Letter from Jeffrey Carlisle, Executive Vice President, LightSquared, to Marlene H. Dortch, Secretary, Federal Communications Commission, IB Docket No. 11-109, at 1 (filed Aug. 11, 2011). As is LightSquared’s pattern, it has the technical details all wrong. As the DoD has made clear, the SIS standards “defines the levels of performance the U.S. Government makes available to users of the Global Positioning System.” Those standards are the U.S. government’s commitments as to how the GPS constellation will perform. They do not specify performance standards for commercial GPS receivers. Indeed, DoD has said that the receiver characteristics it specified “are not intended to impose any minimum requirements on receiver manufacturers or integrators...[r]eceiver characteristics used in this standard are required in order to establish a frame of reference in which the SPS IS performance can be described.” See Dept. of Defense, Global Positioning System Standard Positioning Service Performance Standard, at 7 (4th ed. 2008).

^{84/} LightSquared Comments, at 5, 11.

^{85/} Public Interest Comments, at 6-7.

GPS use of the L-Band does not prevent use of the adjacent band spectrum; it prevents *incompatible* adjacent band use, as the FCC recognized all along. Trimble does not suggest that spectrum should be left to lay fallow. Instead, long-term planning should balance the costs and benefits of placement of high-powered terrestrial use in particular satellite bands with the costs and benefits associated with the operation of GPS as the only ubiquitous use in the band. Sound public policy would be to concentrate like uses around GPS to prevent harmful interference and increase the efficiency of the spectrum surrounding GPS, and then repurpose the remaining spectrum. For example, the FCC should seriously examine other satellite-based services and determine whether they may be relocated to the current MSS L-Band, if, as all available evidence suggests, LightSquared's proposed terrestrial use will interfere with GPS. The affected satellite spectrum could then be used for terrestrial operations.

Such efforts constitute sound spectrum planning, and do not equate to a guard band as some FCC officials have said recently. In particular, Wireless Telecommunications Bureau Chief Rick Kaplan, in reference to LightSquared's lower 10 MHz proposal, recently stated, "We'd like not to see 20 or 30 megahertz of guard band spectrum become the norm."^{86/} The 23 MHz of separation between LightSquared's operations and the GPS spectrum is not a guard band among like services. And Trimble does not propose any guard band; rather, this spectrum should be used for other services – other satellite services – that would be compatible with neighboring GPS operations.

Further, contrary to LightSquared and its supporters' assertions, the manner in which the Commission decides to handle the issue of harmful interference in this instance will *not* establish a precedent on incumbent use – except where incumbent uses are technologically incompatible

^{86/} Lynn Stanton, *FCC Chairman, Staff Pledge to Protect GPS Operations*, TR DAILY (Aug. 9, 2011).

with proposed uses, and a cost effective solution that does not squander or impinge on billions of dollars of public and private investment cannot be found. GPS is not just another spectrum use. It represents decades of public and private investment, an unparalleled track record of innovation, and untold economic and other benefits. As a witness from the U.S. Department of Transportation put it at a recent Congressional hearing:

Today, the use of GPS is ubiquitous. Indeed, no one knows how many commercial uses are built around GPS; worldwide sales of GPS navigation devices exceed \$20 billion, annually, and an estimated \$3 trillion worth of commerce relies on GPS for tracking, timing and navigation. Whatever the actual number, the decision to provide GPS as a free service constitutes one of America's greatest economic gifts to the world since the Marshall Plan.^{87/}

There is clearly a need to repurpose underutilized spectrum for terrestrial wireless broadband use. This does not mean that this approach makes sense for every spectrum band, particularly one adjacent to the most successful and ubiquitous use of satellite spectrum. Indeed, the Presidential policy statement calling for concerted action to free up spectrum for broadband expressly recognized this by stating that spectrum should not be repurposed for wireless broadband if doing so would result in the "loss of critical existing and planned Federal, State, local, and tribal government capabilities."^{88/}

In this case, the FCC must not let its spectrum planning efforts be driven by private proposals to redevelop and repurpose critical spectrum, no matter how laudable the ultimate goal of these proposals may be. Rather, Trimble urges the Commission to engage in sound spectrum planning to ensure that highly valued, ubiquitous uses like GPS are not threatened by the entry of

^{87/} *GPS Reliability: A Review of Aviation Industry Performance, Safety Issues and Avoiding Potential New and Costly Government Burdens Before the Subcomms. on Aviation and Coast Guard and Maritime Transportation of the H. Comm. On Transportation and Infrastructure, 112th Cong., at 1 (June 23, 2011).*

^{88/} White House Office of the Press Secretary, *Presidential Memorandum: Unleashing the Wireless Broadband Revolution*, § 1 (June 28, 2010), available at <http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution>.

new services into neighboring bands. This kind of planning is not aided by simplistic and self-serving assertions of “spectrum squatting.”^{89/} This is nothing more than self-serving rhetoric that has nothing to do with the public interest, or any legitimate private interest. The bottom line is that GPS amounts to a successful, ubiquitous use of the spectrum that must be kept near compatible uses. In this case, LightSquared failed to adequately analyze the consequences of its proposals before proceeding to spend fantastic amounts of its investors’ money. Until LightSquared can provide credible evidence that these proposals will not seriously disrupt a national asset, it cannot be permitted to move forward.

VII. LIGHTSQUARED IS SOLELY RESPONSIBLE FOR RESOLVING INTERFERENCE ISSUES CAUSED BY ITS PROPOSED OPERATIONS

In its comments, Sprint indicates that resolving interference can “be a mutual responsibility of the transmitting and receiving parties.”^{90/} While there have been certain circumstances (such as the instant case) where the receiving party has cooperated with the FCC and the transmitting party in finding a solution to interference issues, the FCC has consistently ensured that existing licensees are protected from harmful interference when new service rules are adopted by placing the obligation to resolve interference issues squarely upon the providers of the new service.^{91/}

^{89/} See LightSquared Comments, at 5; Public Interest Comments, at 6.

^{90/} Sprint Comments, at 8.

^{91/} See, e.g., *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, Report and Order, 18 FCC Rcd 1962 (2003) (adopting the integrated service rule and imposing emission limits and other restrictions on ATC operations to protect existing adjacent band services such as GPS and Personal Communications Service operations); *Globalstar Licensee LLC, Authority to Implement an Ancillary Terrestrial Component*, Report and Order and Order Proposing Modification, 23 FCC Rcd 7210, ¶¶ 31-32, 34 (2008) (requiring MSS licensee Globalstar to adhere to certain out-of-band emission standards in order to protect Broadband Radio Service operations); *Amendments to Parts 1, 2, 27 and 90 of the Commission’s Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, 17 FCC Rcd 9980, ¶¶ 118-

Even the FCC decisions and other materials cited by Sprint fail to show that harmful interference is a matter for the incumbent receiving party to resolve.^{92/} Sprint quotes a Commission order in support of its assertion that the Commission requires both parties involved in an interference dispute to share the burden of resolving interference issues, when in fact this order specifically found that the transmissions of the new service had an obligation to protect the existing service.^{93/} In addition, Sprint cites the 800 MHz rebanding order for the proposition that resolving interference is a shared responsibility, but anyone even vaguely familiar with 800 MHz rebanding knows that the Commission imposed the responsibility for resolving the interference problems in that situation on Nextel as the transmitting party causing interference to existing public safety communications systems.^{94/}

Further, in each of the cases cited by Sprint, the FCC made a threshold determination that the adjacent band operations would be compatible. As demonstrated by the TWG test results, that is simply not the case here. In fact, the opposite is true – LightSquared’s proposed operations will cause devastating interference to all types of GPS devices.

130 (2002) (including certain emission mask requirements designed to protect adjacent band services in the service rules for bands transferred from the Federal government to private use).

^{92/} In apparent support of its position that the FCC has investigated receiver performance standards as a way to permit more intense use of adjacent bands, Sprint notes a 2003 NTIA document which in turn references an FCC proceeding. Sprint Comments, at 6-7. However, the FCC terminated that proceeding without action saying that “there does not appear to be a need for further Commission action at this time.” *Interference Immunity Performance Specifications for Radio Receivers*, Order, 22 FCC Rcd 8941, ¶ 2 (2007).

^{93/} See Sprint Comments, at 8; *Improving Public Safety Communications in the 800 MHz Band, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 24 FCC Rcd 7904, ¶ 52 (2009) (“We emphasize that MSS entrants must avoid operation of their mobile terminals where it will cause harmful interference to BAS. If harmful interference does occur to the nonrelocated BAS incumbents from the MSS entrants, the MSS entrant must take all actions to correct the interference, up to and including curtailing operation in and around the affected markets.”).

^{94/} See Sprint Comments, at 8-9; *Improving Public Safety Communications in the 800 MHz Band, et al.*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, ¶ 300 (2004) (“Moreover, Nextel is not only bearing the entire cost of solving the problem, but is supporting the optimal solution to the problem – band reconfiguration . . .”).

Even if there was technical compatibility for adjacent band operations, Sprint's citation to the 800 MHz rebanding shows exactly why the FCC should not pursue a plan that would involve modification of incumbent operations. Simply put, the 800 MHz forced migration is widely viewed as a disaster. As the National Public Safety Telecommunications Council ("NPSTC") in its comments states:

The Commission and public safety already have extensive experience on the problems created when interference must be resolved after the fact. Public Safety has been involved in the multi-year 800 MHz rebanding initiative in which the time originally predicted for conclusion continues to expand. Public safety simply does not have the resources needed to 'fix' another major interference problem after-the-fact.^{95/}

Recent press reports also ask whether "LightSquared [will] be another Nextel . . . That process still is unfolding seven years after the commission approved its landmark 800 MHz rebanding order."^{96/} It seems that the Commission would be hard-pressed to find any good reason to walk down a road similar to the difficult path that ended up being taken in the 800 MHz context.

In any event, the 800 MHz interference issue first and foremost was a spectrum problem, with an ancillary equipment problem. In other words, all parties involved agreed that the solution in the 800 MHz band was to create contiguous blocks of spectrum which then forced equipment change. The replacement of associated equipment was necessary to ensure that such equipment would work using the new spectrum allocations. Such a situation is a far cry from the situation between LightSquared and GPS. Here, the spectrum already is allocated in contiguous blocks and the TWG test results have conclusively shown that there will be harmful interference to GPS caused by LightSquared's proposed terrestrial network. Further, and as the TWG test results show, there is no equipment solution. Filters generally do not exist and even if they did,

^{95/} NPSTC Comments, at 6.

^{96/} Howard Buskirk, *LightSquared Not a Second Nextel, Executive Tells APCO*, COMM. DAILY, at 6 (Aug. 10, 2011).

retrofitting existing devices would be nearly impossible as a practical matter. Consequently, Sprint's arguments are inapposite.

VIII. CONCLUSION

Thousands of comments have been filed in response to the report submitted by the FCC-mandated Technical Working Group, and the overwhelming majority of commenters agree that serious concerns remain regarding the potential for LightSquared's proposed terrestrial operations to cause devastating interference to GPS. Comments filed in support of LightSquared were limited, failed to address substantively the interference concerns at issue in this proceeding, and consisted primarily of filings by LightSquared's business partners and affiliated entities. While Trimble agrees that there is a need for additional wireless broadband capacity, satisfying such a need by harming a service critical to the economic vitality and safety of persons in this country would be unconscionable. Consequently, it is time for the Commission to rescind the waiver granted to LightSquared earlier this year and ensure that LightSquared's proposed operations are not allowed to operate in a way that would cause irreparable harm to GPS.

Respectfully submitted,

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